كلية الصيدلة جامعه طيبه

College of Pharmacy
Taibah University

Pharmaceutics II (PPT 242)

Practical Handout for Technicians

Student Name: ....

Student ID number: ....

Department of Pharmaceutics and
Pharmaceutical Technology
2018/2019

Practical Handout for Technicians

Instruction to the technicians

- Try to prepare the chemicals in at least three separate bottles and keep it on each table of the Lab, to avoid the students to gather in one place.

- Check the water levels of all the water baths and turn it on before the lab at 70^0C.

- Fill up the distil water cans to avoid immediate necessity.

- Always keep some excess glassware's/tools handy, students may break accidentally and may need it.

- Ensure the availability of hand soap, detergent, scrubber, tissues, sprinklers on each bench.

- Ensure First aid box & fire extinguisher is available always at hand.

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Solutions

Solutions-Prescription 1-Instructions for Technicians

Simple Syrup

Chemicals needed for 25 students:

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Sucrose	1 Kg	Table sugar
2	Water	2 Liters	Distilled water

Glassware's/Tools required for 25 students:

Sl. No	Glassware/Tool	Size	Quantity Required	Remarks
1	Weighing papers	A7	25	Any paper
2	Analytical Balances	Max 450 g	6	
3	Water Baths	6 holders	3	Check the water level
4	Beakers	50 mL	25	
5	Beakers	100 mL	25	
6	Glass rods	---	25	
7	Spatula	---	25	
8	Funnels	50 mm	25	
9	Filter papers	120 mm	25	
10	Graduated cylinders	100 mL	---	
11	Graduated cylinders	50 mL	25	
12	Dispensing Bottles	100 mL	25	
13	Porcelain Mortar & pestle	500 mL	---	
14	Glass Mortar & pestle	150 mL	---	
15	Plastic pipettes	3 mL	---	
16	Labels (white/Red)	---	25	
17	Hand Gloves	---	---	
18	Face mask	---	---	

Note:

- Try to prepare the chemicals in at least three separate bottles and keep it on each table of the Lab, to avoid the students to gather in one place.
- Check the water levels of all the water baths and turn it on before the lab at 70^0C.
- Fill up the distil water cans to avoid immediate necessity.
- Always keep some excess glassware's/tools handy, students may break accidentally and may need it.
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Solutions-Prescription 2-Instructions for Technicians

Cough Syrup

Chemicals needed for 25 students:

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Ammonium Chloride	75 g	
2	Liquid Extract of Liquorice	100 mL	Method of preparation on page 40
3	Syrup	750 mL	Prepare syrup
4	Water	2 L	Distilled water

Glassware's/Tools required for 25 students:

Sl. No	Glassware/Tool	Size	Quantity Required	Remarks
1	Weighing papers	A7	25	Any paper
2	Analytical Balances	Max 450 g	6	
3	Water Baths	6 holders	---	
4	Beakers	50 mL	25	
5	Beakers	100 mL	---	
6	Glass rods	---	25	
7	Spatula	---	25	
8	Funnels	50 mm	---	
9	Filter papers	120 mm	---	
10	Graduated cylinders	100 mL	---	
11	Graduated cylinders	50 mL	25	
12	Dispensing Bottles	100 mL	25	
13	Porcelain Mortar & pestle	500 mL	---	
14	Glass Mortar & pestle	150 mL	---	
15	Plastic pipettes	3 mL	25	
16	Labels (white/Red)	---	25	
17	Hand Gloves	---	---	
18	Face mask	---	---	

Note:

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- Always keep some excess glassware's/tools handy, students may break accidentally and may need it.
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Method of preparation of liquid extract of liquorice: (25 students)

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Liquorice powder	250 g	
2	Chloroform	250 mL	
3	Ethanol 90%	50 mL	

- Exhaust the liquorice powder with chloroform-water by percolation or maceration (250 g powder and 250 mL water).
- Set aside for 12 hours.
- Decant the clear liquid, filter and evaporate until the total solids is about 50% w/v (final volume around 200 mL).
- Add 1/4 of its volume 90% alcohol (around 50 mL).
- Stand for four weeks and filter.

Method of preparation of Syrup: (25 students)

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Sucrose	1 Kg	Table sugar
2	Water	2 Liters	Distilled water

Procedure (by hot method)

- Dissolve sucrose in a beaker with the required amount of boiling water (9 mL). The solution is hastened by heating on boiling water bath with stirring, taking care to remove the flame from time to time to avoid overheating of syrup.
- When the sugar is completely dissolved, filter rapidly while hot through a filter paper.
- Adjust to the required volume (25 ml) of boiling water.
- Transfer to a dry clean bottle and shake continuously till it cools well.

Note:

100 mL simple syrup contains 85 g sucrose and 45 mL water. Then 25 mL syrup contains 21.25 g sucrose and 11.25 mL water. Three-quarters of this amount (around 8-9 mL) should be used initially.

Solutions-Prescription 3-Instructions for Technicians

Belladonna Mixture Pediatric BP

Chemicals needed for 25 students:

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Belladonna Tincture	50 mL	
2	Syrup	300 mL	Prepare syrup for students
3	Glycerol	150 mL	
4	Benzoic acid solution	50 mL	
5	Compound orange spirit	10 mL	
6	Water	2 L	Distilled water

Glassware's/Tools required for 25 students:

Sl. No	Glassware/Tool	Size	Quantity Required	Remarks
1	Weighing papers	A7	25	Any paper
2	Analytical Balances	Max 450 g	6	
3	Water Baths	6 holders	---	Check the water level
4	Beakers	50 mL	25	
5	Beakers	100 mL	---	
6	Glass rods	---	25	
7	Spatula	---	---	
8	Funnels	50 mm	---	
9	Filter papers	120 mm	---	
10	Graduated cylinders	100 mL	---	
11	Graduated cylinders	50 mL	25	
12	Dispensing Bottles	100 mL	25	
13	Porcelain Mortar & pestle	500 mL	---	
14	Glass Mortar & pestle	150 mL	---	
15	Plastic pipettes	3 mL	25	
16	Labels (white/Red)	---	25	
17	Hand Gloves	---	---	
18	Face mask	---	---	

Note:

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- Fill up the distil water cans to avoid immediate necessity.
- Always keep some excess glassware's/tools handy, students may break accidentally and may need it.
- Ensure the availability of hand soap, detergent, scrubber, tissues, sprinklers on each bench.
- Ensure First aid box & fire extinguisher is available always at hand.

Preparation of Belladonna tincture

- Belladonna tincture 100 mL:
  Macerate around 30 g orange leaves in 120 mL diluted alcohol (50%) for 24 hrs. then filter.

Method of preparation of Syrup:

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Sucrose	1 Kg	Table sugar
2	Water	2 Liters	Distilled water

Procedure (by hot method)

- Dissolve sucrose in a beaker with the required amount of boiling water (9 mL). The solution is hastened by heating on boiling water bath with stirring, taking care to remove the flame from time to time to avoid overheating of syrup.
- When the sugar is completely dissolved, filter rapidly while hot through a filter paper.
- Adjust to the required volume (25 ml) of boiling water.
- Transfer to a dry clean bottle and shake continuously till it cools well.

Note:

100 mL simple syrup contains 85 g sucrose and 45 mL water. Then 25 mL syrup contains 21.25 g sucrose and 11.25 mL water. Three-quarters of this amount (around 8-9 mL) should be used initially.

Preparation of Benzoic acid solution:

- Dissolve 0.2 g of benzoic acid in 100 mL of water.

Preparation of Compound orange spirit:

- Compound orange spirit 50 mL:
  Dissolve orange powder in water to be very concentrated.

Solutions-Prescription 4-Instructions for Technicians

Potassium Citrate Mixture BP

Chemicals needed for 25 students:

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Potassium citrate	500 g	
2	Citric acid	150 g	
3	Syrup	500 mL	Prepare syrup
4	Quillaia Tincture	20 mL	
5	Lemon spirit	10 mL	
6	Double strength chloroform water	500 mL	Prepare
7	Water	2 L	Distilled water

Glassware's/Tools required for 25 students:

Sl. No	Glassware/Tool	Size	Quantity Required	Remarks
1	Weighing papers	A7	25	Any paper
2	Analytical Balances	Max 450 g	6	
3	Water Baths	6 holders	---	
4	Beakers	50 mL	25	
5	Beakers	100 mL	---	
6	Glass rods	---	25	
7	Spatula	---	25	
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14	Glass Mortar & pestle	150 mL	---	
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16	Labels (white/Red)	---	25	
17	Hand Gloves	---	---	
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Method of preparation of Syrup:

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Sucrose	1 Kg	Table sugar
2	Water	2 Liters	Distilled water

Procedure (by hot method)

- Dissolve sucrose in a beaker with the required amount of boiling water (9 mL). The solution is hastened by heating on boiling water bath with stirring, taking care to remove the flame from time to time to avoid overheating of syrup.
- When the sugar is completely dissolved, filter rapidly while hot through a filter paper.
- Adjust to the required volume (25 ml) of boiling water.
- Transfer to a dry clean bottle and shake continuously till it cools well.

Note:

100 mL simple syrup contains 85 g sucrose and 45 mL water. Then 25 mL syrup contains 21.25 g sucrose and 11.25 mL water. Three-quarters of this amount (around 8-9 mL) should be used initially.

Preparation of Quillaia Tincture:

- Quillaia tincture 50 mL:

  Water with little surfactant and green color.

Preparation of Lemon spirit:

- Lemon spirit 25 mL:

  Buy concentrated lemon solution.

Preparation of Double strength chloroform water:

- Double strength chloroform water 0.5 L:

  Prepared by adding 25 mL conc. chloroform to 500 ml of water.

Solutions-Prescription 5-Instructions for Technicians

Rehydration Solution

Chemicals needed for 25 students:

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Potassium citrate	25 g	
2	Sodium Chloride	25 g	
3	Sodium Bicarbonate	25 g	
4	Dextrose	300 g	
5	Chloroform water	2 L	Prepare

Glassware's/Tools required for 25 students:

Sl. No	Glassware/Tool	Size	Quantity Required	Remarks
1	Weighing papers	A7	25	Any paper
2	Analytical Balances	Max 450 g	6	
3	Water Baths	6 holders	---	
4	Beakers	50 mL	25	
5	Beakers	100 mL	---	
6	Glass rods	---	25	
7	Spatula	---	25	
8	Funnels	50 mm	25	
9	Filter papers	120 mm	25	
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12	Dispensing Bottles	100 mL	25	
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14	Glass Mortar & pestle	150 mL	---	
15	Plastic pipettes	3 mL	25	
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Preparation of Chloroform water:

- Chloroform water 0.5 L:

  Prepared by adding 25 mL conc. chloroform to 250 ml of water.

Solutions-Prescription 6-Instructions for Technicians

Anti-rheumatic Mixture

Chemicals needed for 25 students:

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Sodium salicylate	25 g	
2	Sodium bicarbonate	25 g	
3	Sodium metabisulfite	25 g	
4	Tincture of orange peel	100 mL	
5	Peppermint water	2 L	

Glassware's/Tools required for 25 students:

Sl. No	Glassware/Tool	Size	Quantity Required	Remarks
1	Weighing papers	A7	25	Any paper
2	Analytical Balances	Max 450 g	6	
3	Water Baths	6 holders	---	
4	Beakers	50 mL	25	
5	Beakers	100 mL	---	
6	Glass rods	---	25	
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Preparation of Tincture of orange peel

- Take orange peel from the fresh fruit, 500 gm.
- Add a sufficient quantity alcohol 900 mL.
- Mix the orange peel (which should be as free as possible from the inner, white layer), previously cut into small pieces and macerate for 24 hours;
- Conceal it moderately in a conical percolator, and gradually pour alcohol upon it, until tincture is obtained" (U. S. P.).
- This tincture has a golden color and fine aroma. The fresh peel may be grated, avoiding the white portion, or it may be carefully peeled off with a sharp knife.

Preparation of Peppermint water:

- Add 2 mL peppermint oil to 100 mL distilled water and shake vigorously.
- Leave for few hours then filter.

Solutions-Prescription 7-Instructions for Technicians

Compound Sodium Chloride Mouth Wash

Chemicals needed for 25 students:

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Sodium Chloride	25 g	
2	Sodium bicarbonate	25 g	
3	Amaranth Solution	25 g	
4	Peppermint water	2 L	

Glassware's/Tools required for 25 students:

Sl. No	Glassware/Tool	Size	Quantity Required	Remarks
1	Weighing papers	A7	25	Any paper
2	Analytical Balances	Max 450 g	6	
3	Water Baths	6 holders	---	
4	Beakers	50 mL	25	
5	Beakers	100 mL	---	
6	Glass rods	---	25	
7	Spatula	---	---	
8	Funnels	50 mm	---	
9	Filter papers	120 mm	---	
10	Graduated cylinders	100 mL	25	
11	Graduated cylinders	50 mL	---	
12	Dispensing Bottles	100 mL	25	
13	Porcelain Mortar & pestle	500 mL	---	
14	Glass Mortar & pestle	150 mL	---	
15	Plastic pipettes	3 mL	25	
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17	Hand Gloves	---	---	
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Preparation of Amaranth solution (1%):

- Dissolve 0.25 g amaranth powder in 25 mL distilled water.
- Filter if necessary.

Preparation of Peppermint water:

- Add 2 mL peppermint oil to 100 mL distilled water and shake vigorously.
- Leave for few hours then filter.

Solutions-Prescription 8-Instructions for Technicians

Potassium Permanganate 0.2% Solution

Chemicals needed for 25 students:

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Potassium Permanganate	10 g	Handle with care
2	Freshly boiled and cooled purified water	2 L	Use Distil water

Glassware's/Tools required for 25 students:

Sl. No	Glassware/Tool	Size	Quantity Required	Remarks
1	Weighing papers	A7	25	Any paper
2	Analytical Balances	Max 450 g	6	
3	Water Baths	6 holders	---	
4	Beakers	50 mL	25	
5	Beakers	100 mL	---	
6	Glass rods	---	25	
7	Spatula	---	25	
8	Funnels	50 mm	---	
9	Filter papers	120 mm	---	
10	Graduated cylinders	100 mL	---	
11	Graduated cylinders	50 mL	25	
12	Dispensing Bottles	100 mL	25	
13	Porcelain Mortar & pestle	500 mL	25	
14	Glass Mortar & pestle	150 mL	25	
15	Plastic pipettes	3 mL	25	
16	Labels (white/Red)	---	25	
17	Hand Gloves	---	25	
18	Face mask	---	25	

Note:

- Potassium permanganate is an oxidizing substance and stains also, so handle with care.
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Suspensions

Suspension-Prescription 1-Instructions for Technicians

Magnesium Trisilicate Mixture

Chemicals needed for 25 students:

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Magnesium Trisilicate	100 g	
2	Light Magnesium Carbonate	100 g	
3	Sodium Bicarbonate	100 g	
4	Concentrated Peppermint Emulsion	10 mL	Prepare
5	Double Strength Chloroform water	1 L	Prepare
6	Potable Water	2 L	Use Distil water

Glassware's/Tools required for 25 students:

Sl. No	Glassware/Tool	Size	Quantity Required	Remarks
1	Weighing papers	A7	25	Any paper
2	Analytical Balances	Max 450 g	6	
3	Water Baths	6 holders	---	
4	Beakers	50 mL	25	
5	Beakers	100 mL	---	
6	Glass rods	---	25	
7	Spatula	---	25	
8	Funnels	50 mm	---	
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15	Plastic pipettes	3 mL	25	
16	Labels (white/Red)	---	25	
17	Hand Gloves	---	---	
18	Face mask	---	---	

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Preparation of Concentrated Peppermint Emulsion:

Concentrated Peppermint Emulsion is a 2% v/v dispersion of Peppermint Oil in a suitable vehicle containing a non-ionic surface-active agent.

Extemporaneous preparation:

- The following formula and directions apply.

Peppermint Oil	20 ml
Polysorbate 20 (Tween 20)	1 ml
Double-strength Chloroform Water	500 ml
Purified Water, freshly boiled and cooled	Sufficient to produce 1000 ml

- Shake the Peppermint Oil with the Polysorbate 20 and add gradually, shaking well after each addition, the Double-strength Chloroform Water and sufficient Purified Water to produce 1000 ml.

Preparation of Double strength chloroform water:

- Double strength chloroform water 0.5 L:
  Prepared by adding 25 mL conc. chloroform to 500 ml of water.

Suspension-Prescription 2-Instructions for Technicians

Pediatric Chalk Mixture

Chemicals needed for 25 students:

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Chalk	50 g	Calcium carbonate
2	Tragacanth	25 g	Gum Tragacanth
3	Concentrated Cinnamon Water	25 mL	Prepare
4	Syrup	250 mL	Prepare
5	Double Strength Chloroform water	1 L	Prepare
6	Potable Water	2 L	Use Distil water

Glassware's/Tools required for 25 students:

Sl. No	Glassware/Tool	Size	Quantity Required	Remarks
1	Weighing papers	A7	25	Any paper
2	Analytical Balances	Max 450 g	6	
3	Water Baths	6 holders	---	
4	Beakers	50 mL	25	
5	Beakers	100 mL	---	
6	Glass rods	---	25	
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13	Porcelain Mortar & pestle	500 mL	25	
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15	Plastic pipettes	3 mL	25	
16	Labels (white/Red)	---	25	
17	Hand Gloves	---	---	
18	Face mask	---	---	

Note:

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Prepare Concentrated Cinnamon Water

- To produce 100 mL of Concentrated Cinnamon Water:

Cinnamon Oil	2 ml
Ethanol (90 per cent)	60 ml
Water	100 ml

Extemporaneous preparation:

The following directions apply:

- Dissolve the Cinnamon Oil in the Ethanol (90 per cent) and add gradually, with vigorous shaking after each addition, sufficient Water to produce 100 ml.
- Add 50 g of previously sterilised Purified Talc, or other suitable filtering aid, allow to stand for a few hours, shaking occasionally, and filter.

Method of preparation of Syrup: (25 students)

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Sucrose	1 Kg	Table sugar
2	Water	2 Liters	Distilled water

Procedure (by hot method)

- Dissolve sucrose in a beaker with the required amount of boiling water (9 mL). The solution is hastened by heating on boiling water bath with stirring, taking care to remove the flame from time to time to avoid overheating of syrup.
- When the sugar is completely dissolved, filter rapidly while hot through a filter paper.
- Adjust to the required volume (25 ml) of boiling water.
- Transfer to a dry clean bottle and shake continuously till it cools well.

Note:

100 mL simple syrup contains 85 g sucrose and 45 mL water. Then 25 mL syrup contains 21.25 g sucrose and 11.25 mL water. Three-quarters of this amount (around 8-9 mL) should be used initially.

Preparation of Double strength chloroform water:

- Double strength chloroform water 0.5 L:

  Prepared by adding 25 mL conc. chloroform to 500 ml of water.

Suspension-Prescription 3-Instructions for Technicians

Clobazam Suspension

Chemicals needed for 25 students:

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Clobazam	250 tablets of 10 mg	Any expired tablet
2	Peppermint Water	50 mL	Prepare
3	Glycerol	100 mL	Prepare
4	Syrup	500 mL	Prepare
5	Compound powder of tragacanth	40 g	Prepare
6	Freshly boiled and cooled purified water	2 L	Use Distil water

Glassware's/Tools required for 25 students:

Sl. No	Glassware/Tool	Size	Quantity Required	Remarks
1	Weighing papers	A7	25	Any paper
2	Analytical Balances	Max 450 g	6	
3	Water Baths	6 holders	---	
4	Beakers	50 mL	25	
5	Beakers	100 mL	---	
6	Glass rods	---	25	
7	Spatula	---	25	
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18	Face mask	---	---	

Note:

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- Always keep some excess glassware's/tools handy, students may break accidentally and may need it.
- Ensure the availability of hand soap, detergent, scrubber, tissues, sprinklers on each bench.
- Ensure First aid box & fire extinguisher is available always at hand.

Preparation of Peppermint water:

- Add 2 mL peppermint oil to 100 mL distilled water and shake vigorously.
- Leave for few hours then filter.

Method of preparation of Syrup: (25 students)

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Sucrose	1 Kg	Table sugar
2	Water	2 Liters	Distilled water

Procedure (by hot method)

- Dissolve sucrose in a beaker with the required amount of boiling water (9 mL). The solution is hastened by heating on boiling water bath with stirring, taking care to remove the flame from time to time to avoid overheating of syrup.
- When the sugar is completely dissolved, filter rapidly while hot through a filter paper.
- Adjust to the required volume (25 ml) of boiling water.
- Transfer to a dry clean bottle and shake continuously till it cools well.

Note:

100 mL simple syrup contains 85 g sucrose and 45 mL water. Then 25 mL syrup contains 21.25 g sucrose and 11.25 mL water. Three-quarters of this amount (around 8-9 mL) should be used initially.

Preparation of Compound powder of tragacanth:

- To make 40 g of Compound Tragacanth Powder:

Tragancanth	15%	6 g
Acacia	20%	8 g
Starch	20%	8 g
Sucrose	45%	18 g

- Mix all this in a mortar and store in a bottle.
- Used generally as 2 g powder per 100 mL suspension.

Emulsions

Emulsion-Prescription 1-Instructions for Technicians

Liquid Paraffin Emulsion

Chemicals needed for 25 students:

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Liquid Paraffin	500 mL	
2	Acacia	200 g	Buy and grind it
3	Double Strength Chloroform Water	1 L	Prepare
4	Freshly boiled and cooled purified water	2 L	Use Distil water

Glassware's/Tools required for 25 students:

Sl. No	Glassware/Tool	Size	Quantity Required	Remarks
1	Weighing papers	A7	25	Any paper
2	Analytical Balances	Max 450 g	6	
3	Water Baths	6 holders	---	
4	Beakers	50 mL	25	
5	Beakers	100 mL	---	
6	Glass rods	---	25	
7	Spatula	---	---	
8	Funnels	50 mm	---	
9	Filter papers	120 mm	---	
10	Graduated cylinders	100 mL	---	
11	Graduated cylinders	50 mL	25	
12	Dispensing Bottles	100 mL	25	
13	Porcelain Mortar & pestle	500 mL	---	
14	Glass Mortar & pestle	150 mL	---	
15	Plastic pipettes	3 mL	25	
16	Labels (white/Red)	---	25	
17	Hand Gloves	---	---	
18	Face mask	---	---	

Note:

- Try to prepare the chemicals in at least three separate bottles and keep it on each table of the Lab, to avoid the students to gather in one place.
- Fill up the distil water cans to avoid immediate necessity.
- Always keep some excess glassware's/tools handy, students may break accidentally and may need it.
- Ensure the availability of hand soap, detergent, scrubber, tissues, sprinklers on each bench.
- Ensure First aid box & fire extinguisher is available always at hand.

Preparation of Acacia:

- Buy Acacia gum from market and grind it in mixer.
- Buy 2 kgs. for both emulsions and well as for the revision and exams.

Preparation of Double strength chloroform water:

- Double strength chloroform water 0.5 L:

  Prepared by adding 25 mL conc. chloroform to 500 ml of water.

Emulsion-Prescription 2-Instructions for Technicians

Castor Oil Emulsion

Chemicals needed for 25 students:

Sl. No	Chemical name	Approximate Quantity Required	Remarks
1	Castor oil	500 mL	
2	Acacia	200 g	Buy and grind it
3	Double Strength Chloroform Water	1 L	Prepare
4	Freshly boiled and cooled purified water	2 L	Use Distil water

Glassware's/Tools required for 25 students:

Sl. No	Glassware/Tool	Size	Quantity Required	Remarks
1	Weighing papers	A7	25	Any paper
2	Analytical Balances	Max 450 g	6	
3	Water Baths	6 holders	---	
4	Beakers	50 mL	25	
5	Beakers	100 mL	---	
6	Glass rods	---	25	
7	Spatula	---	---	
8	Funnels	50 mm	---	
9	Filter papers	120 mm	---	
10	Graduated cylinders	100 mL	---	
11	Graduated cylinders	50 mL	25	
12	Dispensing Bottles	100 mL	25	
13	Porcelain Mortar & pestle	500 mL	---	
14	Glass Mortar & pestle	150 mL	---	
15	Plastic pipettes	3 mL	25	
16	Labels (white/Red)	---	25	
17	Hand Gloves	---	---	
18	Face mask	---	---	

Note:

- Try to prepare the chemicals in at least three separate bottles and keep it on each table of the Lab, to avoid the students to gather in one place.
- Fill up the distil water cans to avoid immediate necessity.
- Always keep some excess glassware's/tools handy, students may break accidentally and may need it.
- Ensure the availability of hand soap, detergent, scrubber, tissues, sprinklers on each bench.
- Ensure First aid box & fire extinguisher is available always at hand.

Preparation of Acacia:

- Buy Acacia gum from market and grind it in mixer.
- Buy 2 kgs. for both emulsions and well as for the revision and exams.

Preparation of Double strength chloroform water:

- Double strength chloroform water 0.5 L:
  Prepared by adding 25 mL conc. chloroform to 500 ml of water.

Notes: